

IN THE CLAIMS:

1. (Currently Amended) A display apparatus for displaying an image on a display device which includes rows of pixels, each pixel composed of three sub-pixels that align in a lengthwise direction of the pixel rows and emit light of three primary colors respectively, the display apparatus comprising:

5 a frame memory storing color values of an image to be displayed on the display device;

 a front image storage unit ~~operable to store~~ storing color values of sub-pixels that constitute at least one ~~[[a]]~~ front image to be displayed on the display device;

 a calculation unit ~~operable to acquiring~~ acquiring color values of first-target-range sub-
10 pixels that constitute a front image and are composed of a target sub-pixel and one or more
adjacent sub-pixels that are adjacent to the target sub-pixel in the lengthwise direction of the
pixel rows, and to calculate a dissimilarity level of the target sub-pixel to the one or more
adjacent sub-pixels from the acquired color values; ~~calculate a dissimilarity level of a target sub-~~
~~pixel to one or more sub-pixels that are adjacent to the target sub-pixel in the lengthwise~~
15 ~~direction of the pixel rows, from color values of first-target-range sub-pixels composed of the~~
~~target sub-pixel and the one or more adjacent sub-pixels stored in the front image storage unit;~~

 a superimposing unit ~~operable to acquiring~~ acquiring the color values from the frame
memory as color values of a back image, and generate, from the color values of the front image
acquired from ~~stored in~~ the front image storage unit and color values of the back image acquired
20 from the frame memory ~~an image currently displayed on the display device~~, color values of sub-
pixels constituting a composite image of the front image and the ~~currently displayed~~ back image;

a filtering unit ~~operable to smooth~~ smoothing out color values of second-target-range sub-pixels of the composite image that correspond to the first-target-range sub-pixels, by assigning weights, which are determined in accordance with the dissimilarity level, to the
25 second-target-range sub-pixels, and to overwrite the color values stored in the frame memory with color values of the composite image after smoothing out; and

a displaying unit ~~operable to display the composite image based on the color values thereof after the smoothing out.~~ displaying an image based on the color values of the composite image after the smoothing out stored in the frame memory, wherein
30 in the smoothing out by the filtering unit, assignment of a larger weight causes a greater degradation of image, and

when the front image storage unit stores color values of a plurality of front images and when the superimposing unit is to generate color values of another composite image using color values of another front image among the plurality of front images, the superimposing unit
35 uses the color values stored in the frame memory after the overwriting by the filtering unit, as color values of a back image.

2. (Previously Presented) The display apparatus of Claim 1, wherein

the calculation unit calculates a temporary dissimilarity level for each combination of the first-target-range sub-pixels, from color values of the first-target-range sub-pixels, and regards a largest temporary dissimilarity level among results of the calculation to be
5 the dissimilarity level.

3. (Original) The display apparatus of Claim 2, wherein
the first-target-range sub-pixels and the second-target-range sub-pixels are
identical with each other in number and positions in the display device.

4. (Original) The display apparatus of Claim 1, wherein
the filtering unit performs the smoothing out of the second-target-range sub-pixels
if the dissimilarity level calculated by the calculation unit is greater than a predetermined
threshold value, and does not perform the smoothing out if the calculated dissimilarity level is no
5 greater than the predetermined threshold value.

5. (Currently Amended) A display apparatus for displaying an image on a display
device which includes rows of pixels, each pixel composed of three sub-pixels that align in a
lengthwise direction of the pixel rows and emit light of three primary colors respectively, the
display apparatus comprising:

5 a frame memory storing color values of an image to be displayed on the display
device;

a front image storage unit ~~operable to store~~ storing color values and transparency
values of sub-pixels that constitute at least one ~~[[a]]~~ front image to be displayed on the display
device, where the transparency values indicate degrees of transparency of sub-pixels of the front
10 image when the front image is superimposed on an image currently displayed on the display
device;

a calculation unit ~~operable to~~ acquiring color values and transparency values of
first-target-range sub-pixels that constitute a front image and are composed of a target sub-pixel
and one or more adjacent sub-pixels that are adjacent to the target sub-pixel in the lengthwise

15 direction of the pixel rows, and to calculate a dissimilarity level of the target sub-pixel to the one
or more adjacent sub-pixels from the acquired color values and transparency values; calculate a
dissimilarity level of a target sub-pixel to one or more sub-pixels that are adjacent to the target
sub-pixel in the lengthwise direction of the pixel rows, from (i) color values and (ii) transparency
values of first-target-range sub-pixels composed of the target sub-pixel and the one or more
20 adjacent sub-pixels stored in the front image storage unit;

a superimposing unit operable to acquiring the color values from the frame
memory as color values of a back image, and generate, from color values of the front image
acquired from stored in the front image storage unit and the color values of the back image
acquired from the frame memory, currently displayed on the display device, color values of sub-
25 pixels constituting a composite image of the front image and the currently displayed back image;

a filtering unit operable to smooth smoothing out color values of second-target-
range sub-pixels of the composite image that correspond to the first-target-range sub-pixels, by
assigning weights, which are determined in accordance with the dissimilarity level, to the
second-target-range sub-pixels, and to overwrite the color values stored in the frame memory
30 with color values of the composite image after the smoothing out; and

a displaying unit operable to display the composite displaying an image based on
the color values thereof of the composite image after the smoothing out stored in the frame
memory, wherein

in the smoothing out by the filtering unit, assignment of a larger weight causes a
35 greater degradation of image, and

when the front image storage unit stores color values of a plurality of front images
and when the superimposing unit is to generate color values of another composite image using

color values of another front image among the plurality of front images, the superimposing unit
uses the color values stored in the frame memory after the overwriting by the filtering unit, as
40 color values of a back image.

6. (Original) The display apparatus of Claim 5, wherein

the calculation unit calculates a temporary dissimilarity level for each
combination of the first-target-range sub-pixels, from at least one of (i) color values and (ii)
transparency values of the first-target-range sub-pixels, and regards a largest temporary
5 dissimilarity level among results of the calculation to be the dissimilarity level.

7. (Original) The display apparatus of Claim 6, wherein

the first-target-range sub-pixels and the second-target-range sub-pixels are
identical with each other in number and positions in the display device.

8. (Original) The display apparatus of Claim 5, wherein

the filtering unit performs the smoothing out of the second-target-range sub-pixels
if the dissimilarity level calculated by the calculation unit is greater than a predetermined
threshold value, and does not perform the smoothing out if the calculated dissimilarity level is no
5 greater than the predetermined threshold value.

9. (Currently Amended) A display method for use in a display apparatus for
displaying an image on a display device, the display apparatus including a frame memory storing
color values of an image to be displayed on the display device, the display device including
~~which includes~~ rows of pixels, each pixel composed of three sub-pixels that align in a lengthwise

5 direction of the pixel rows and emit light of three primary colors respectively, the display method comprising:

a front image acquiring step for acquiring color values of first-target-range sub-pixels composed of a target sub-pixel and one or more sub-pixels that are adjacent to the target sub-pixel in the lengthwise direction of the pixel rows, the first-target-range sub-pixels are
10 included in sub-pixels that constitute a front image to be displayed on the display device;

a calculation step for calculating a dissimilarity level of the target sub-pixel to the one or more sub-pixels, from the color values of the first-target-range sub-pixels acquired in the front image acquiring step;

a superimposing step for acquiring the color values from the frame memory as
15 color values of a back image, and generating, from the color values of the front image acquired in the front image acquiring step and color values of the back image acquired from the frame memory, ~~an image currently displayed on the display device~~, color values of sub-pixels constituting a composite image of the front image and the ~~currently displayed~~ back image;

a filtering step for smoothing out color values of second-target-range sub-pixels
20 of the composite image that correspond to the first-target-range sub-pixels, by assigning weights, which are determined in accordance with the dissimilarity level, to the second-target-range sub-pixels, and overwriting the color values stored in the frame memory with color values of the composite image after the smoothing out; and

a displaying step for displaying ~~the composite image based on the color values~~
25 ~~thereof after the smoothing out~~, an image based on the color values of the composite image after the smoothing out stored in the frame memory, wherein

in the smoothing out in the filtering step, assignment of a larger weight causes a greater degradation of image, and

when color values of another front image are acquired in the front image
30 acquiring step, the superimposing step generates color values of a composite image using the
acquired color values of said another front image and the color values stored in the frame
memory after the overwriting in the filtering step, as color values of a back image.

10. (Currently Amended) A display method for use in a display apparatus for
displaying an image on a display device, the display apparatus including a frame memory storing
color values of an image to be displayed on the display device, the display device including
~~which includes~~ rows of pixels, each pixel composed of three sub-pixels that align in a lengthwise
5 direction of the pixel rows and emit light of three primary colors respectively, the display method
comprising:

a front image acquiring step for acquiring color values and transparency values of
first-target-range sub-pixels composed of a target sub-pixel and one or more sub-pixels that are
adjacent to the target sub-pixel in the lengthwise direction of the pixel rows, the first-target-range
10 sub-pixels are included in sub-pixels that constitute a front image to be displayed on the display
device, where the transparency values indicate degrees of transparency of sub-pixels of the front
image when the front image is superimposed on an image currently displayed on the display
device;

a calculation step for calculating a dissimilarity level of the target sub-pixel to the
15 one or more sub-pixels~~[[,]]~~from ~~[[i)]]~~ the color values and ~~[[ii)]]~~ transparency values of the
first-target-range sub-pixels acquired in the front image acquiring step;

a superimposing step for acquiring the color values from the frame memory as color values of a back image, and generating, from the color values of the front image acquired in the front image acquiring step and color values of the ~~currently displayed~~ back image acquired
20 from the frame memory, color values of sub-pixels constituting a composite image of the front image and the ~~currently displayed~~ back image;

a filtering step for smoothing out color values of second-target-range sub-pixels of the composite image that correspond to the first-target-range sub-pixels, by assigning weights, which are determined in accordance with the dissimilarity level, to the second-target-range sub-
25 pixels, and overwriting the color values stored in the frame memory with color values of the composite image after the smoothing out; and

a displaying step for displaying ~~the composite image based on the color values thereof after the smoothing out.~~ an image based on the color values of the composite image after the smoothing out stored in the frame memory, wherein

30 in the smoothing out in the filtering step, assignment of a larger weight causes a greater degradation of image, and

when color values and transparency values of another front image are acquired in the front image acquiring step, the superimposing step generates color values of a composite image using the acquired color values of said another front image and the color values stored in
35 the frame memory after the overwriting in the filtering step, as color values of a back image.

11. (Currently Amended) A computer-readable recording medium storing a display program for displaying an image, of which color values are stored in a frame memory, on a display device which includes rows of pixels, each pixel composed of three sub-pixels that align

in a lengthwise direction of the pixel rows and emit light of three primary colors respectively, the
5 display program causing a computer to execute:

a front image acquiring step for acquiring color values of first-target- range sub-pixels composed of a target sub-pixel and one or more sub-pixels that are adjacent to the target sub-pixel in the lengthwise direction of the pixel rows, the first-target-range sub-pixels are included in sub-pixels that constitute a front image to be displayed on the display device;

10 a calculation step for calculating a dissimilarity level of the target sub-pixel to the one or more sub-pixels, from the color values of the first-target-range sub-pixels acquired in the front image acquiring step;

a superimposing step for acquiring the color values from the frame memory as color values of a back image, and generating, from the color values of the front image acquired
15 in the front image acquiring step and color values of an image currently displayed the back image acquired from the frame memory, on the display device, color values of sub-pixels constituting a composite image of the front image and the ~~currently displayed~~ back image;

a filtering step for smoothing out color values of second-target-range sub-pixels of the composite image that correspond to the first-target-range sub-pixels, by assigning weights,
20 which are determined in accordance with the dissimilarity level, to the second-target- range sub-pixels and overwriting the color values stored in the frame memory with color values of the composite image after the smoothing out; and

a displaying step for displaying ~~the composite image based on the color values thereof after the smoothing out.~~ an image based on the color values of the composite image after
25 the smoothing out stored in the frame memory, wherein

in the smoothing out in the filtering step, assignment of a larger weight causes a greater degradation of image, and

when color values of another front image are acquired in the front image acquiring step, the superimposing step generates color values of a composite image using the acquired color values of said another front image and the color values stored in the frame memory after the overwriting in the filtering step, as color values of a back image.

12. (Currently Amended) A computer-readable recording medium storing a display program for displaying an image, of which color values are stored in a frame memory, on a display device which includes rows of pixels, each pixel composed of three sub-pixels that align in a lengthwise direction of the pixel rows and emit light of three primary colors respectively, the display program causing a computer to execute:

a front image acquiring step for acquiring color values and transparency values of first-target-range sub-pixels composed of a target sub-pixel and one or more sub-pixels that are adjacent to the target sub-pixel in the lengthwise direction of the pixel rows, the first-target-range sub-pixels are included in sub-pixels that constitute a front image to be displayed on the display device, where the transparency values indicate degrees of transparency of sub-pixels of the front image when the front image is superimposed on an image currently displayed on the display device;

a calculation step for calculating a dissimilarity level of the target sub-pixel to the one or more sub-pixels[[.]] from [[(i)]] color values and [[(ii)]] transparency values of the first-target-range sub-pixels acquired in the front image acquiring step;

a superimposing step for acquiring the color values from the frame memory as color values of a back image, and generating, from the color values of the front image acquired in the front image acquiring step and color values of the ~~currently displayed~~ back image acquired from the frame memory, color values of sub-pixels constituting a composite image of the front
20 image and the ~~currently displayed~~ back image;

a filtering step for smoothing out color values of second-target-range sub-pixels of the composite image that correspond to the first-target-range sub-pixels, by assigning weights, which are determined in accordance with the dissimilarity level, to the second-target-range sub-pixels and overwriting the color values stored in the frame memory with color values of the
25 composite image after the smoothing out; and

a displaying step for displaying ~~the composite image based on the color values thereof after the smoothing out.~~ an image based on the color values of the composite image after the smoothing out stored in the frame memory, wherein

in the smoothing out in the filtering step, assignment of a larger weight causes a
30 greater degradation of image, and

when color values and transparency values of another front image are acquired in the front image acquiring step, the superimposing step generates color values of a composite image using the acquired color values of said another front image and the color values stored in the frame memory after the overwriting in the filtering step, as color values of a back image.

13 - 14. (Canceled)

15. (New) The display apparatus of Claim 1, wherein

the front image of which color values are stored in the front image storage unit has a resolution that is, in the lengthwise direction, three times a resolution of the display device, and the front image has color values of three primary colors for each sub-pixel position,

the dissimilarity level calculated by the calculation unit is calculated using the three primary colors for each sub-pixel position,

the superimposing unit acquires, from the frame memory, the color values that are composed of three primary colors for each pixel position, triples the acquired color values in the lengthwise direction such that three sub-pixel positions constituting each pixel have same color value for three primary colors as color values for three primary colors of a corresponding pixel, and uses the tripled color values to generate the color values of the composite image, and

the filtering unit, after the smoothing out, converts the color values having three primary colors for each sub-pixel position to color values having three primary colors for each pixel position, and overwrites the color values stored in the frame memory with the color values after the conversion.

16. (New) The display apparatus of Claim 5, wherein

the front image of which color values are stored in the front image storage unit has a resolution that is, in the lengthwise direction, three times a resolution of the display device, and the front image has color values of three primary colors for each sub-pixel position,

the dissimilarity level calculated by the calculation unit is calculated using the transparency values and the three primary colors for each sub-pixel position,

the superimposing unit acquires, from the frame memory, the color values that are composed of three primary colors for each pixel position, triples the acquired color values in the lengthwise direction such that three sub-pixel positions constituting each pixel have a same color value for three primary colors respectively, and uses the tripled color values to generate the color values of the composite image, and

the filtering unit, after the smoothing out, converts the color values having three primary colors for each sub-pixel position to color values having three primary colors for each pixel position, and overwrites the color values stored in the frame memory with the color values after the conversion.

17. (New) The display method of Claim 9, wherein

the front image of which color values are acquired in the front image acquiring step has a resolution that is, in the lengthwise direction, three times a resolution of the display device, and the front image has color values of three primary colors for each sub-pixel position, the dissimilarity level calculated in the calculation step is calculated using the three primary colors for each sub-pixel position,

the superimposing step acquires, from the frame memory, the color values that are composed of three primary colors for each pixel position, triples the acquired color values in the lengthwise direction such that three sub-pixel positions constituting each pixel have a same color value for three primary colors respectively, and uses the tripled color values to generate the color values of the composite image, and

the filtering step, after the smoothing out, converts the color values having three primary colors for each sub-pixel position to color values having three primary colors for each pixel position, and overwrites the color values stored in the frame memory with the color values
15 after the conversion.

18. (New) The display method of Claim 10, wherein

the front image of which color values are acquired in the front image acquiring step has a resolution that is, in the lengthwise direction, three times a resolution of the display device, and the front image has color values of three primary colors for each sub-pixel position,
5 the dissimilarity level calculated in the calculation step is calculated using the transparency values and the three primary colors for each sub-pixel position,

the superimposing step acquires, from the frame memory, the color values that are composed of three primary colors for each pixel position, triples the acquired color values in the lengthwise direction such that three sub-pixel positions constituting each pixel have a same color
10 value for three primary colors respectively, and uses the tripled color values to generate the color values of the composite image, and

the filtering step, after the smoothing out, converts the color values having three primary colors for each sub-pixel position to color values having three primary colors for each pixel position, and overwrites the color values stored in the frame memory with the color values
15 after the conversion.

19. (New) The computer-readable recording medium of Claim 11, wherein

the front image of which color values are acquired in the front image acquiring step has a resolution that is, in the lengthwise direction, three times a resolution of the display device, and the front image has color values of three primary colors for each sub-pixel position,

5 the dissimilarity level calculated in the calculation step is calculated using the three primary colors for each sub-pixel position,

the superimposing step acquires, from the frame memory, the color values that are composed of three primary colors for each pixel position, triples the acquired color values in the lengthwise direction such that three sub-pixel positions constituting each pixel have a same color
10 value for three primary colors respectively, and uses the tripled color values to generate the color values of the composite image, and

the filtering step, after the smoothing out, converts the color values having three primary colors for each pixel position, and overwrites the color values stored in the frame memory with the color values after the conversion.

20. (New) The computer-readable recording medium of Claim 12, wherein

the front image of which color values are acquired in the front image acquiring step has a resolution that is, in the lengthwise direction, three times a resolution of the display device, and the front image has color values of three primary colors for each sub-pixel position,

5 the dissimilarity level calculated in the calculation step is calculated using the transparency values and the three primary colors for each sub-pixel position,

the superimposing step acquires, from the frame memory, the color values that are composed of three primary colors for each pixel position, triples the acquired color values in the lengthwise direction such that three sub-pixel positions constituting each pixel have a same color

10 value for three primary colors respectively, and uses the tripled color values to generate the color values of the composite image, and

the filtering step, after the smoothing out, converts the color values having three primary colors for each sub-pixel position to color values having three primary colors for each pixel position, and overwrites the color values stored in the frame memory with the color values

15 after the conversion.